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Note on the Structure of the Mammalian Taste-Bulb.

By Frederick Tuckerman.

The results of Professor v. Lenhossék's researches, by means of Golgi's method, on the minute anatomy of the taste-bulbs, recently communicated to this Journal, awaken new interest in these organs. A short time prior to the appearance of Lenhossék's paper Prof. Schulze of the Zoological Institute, Berlin, had kindly called my attention to the main conclusions contained in Prof. Retzius' somewhat earlier and more extended contribution, covering essentially the same ground. The work itself, however, I have not seen.

In 1867 independent inquirers at Stockholm and Bonn reported, almost simultaneously, the presence of sensory terminal organs in the lingual papillae of the Mammalia. Two years later, v. Wyss of Zurich and Engelmann of Utrecht, detected independently the gustatory bulbs in the papillae foliatae or lateral organs of taste.

Now, after the lapse of a quarter of a century, the taste-bulbs have been carefully re-investigated at Stockholm by Retzius, and following close on the heels of his paper comes one from Basel by Lenhossék. The results of the last-named observers are destructive as well as constructive in their character, in that they are quite fatal to the generally accepted notions, touching not only the intrinsic anatomy of these organs, but also their relations to the subepithelial nerve elements. Both observers, it appears, employed similar methods, and both attained results that, in their main purport, appear to be in accord. Thus it may indeed be said with truth that history repeats itself.

In this brief note it is the purpose of the writer to touch only upon that portion of Lenhossék's research which relates to the mammalian taste-bulb. Lenhossék describes and figures nerve terminal structures which he terms the "perigemmale" and the "intergemmale" Nervenendigung respectively. With the latter, I shall not now concern myself. The former, which for the present is of much greater moment, appears to be mainly an amplification of Fusari and Panasci's „reticoli nervosi peribulbari", and is important in that it confirms the earlier work of those histologists. On the other hand, however, I gather from the author that this is the main point at issue between Retzius and himself, i. e. whether there exists a true "perigemmale" Nervenendigung, or, whether it is merely an

intragemmale Nervenendigung, the ultimate fibrils of which pass between the cells forming the framework of the bulb and communicate with the exterior. The existence of reticulated, interlacing nerve filaments within the bulb similar to, if not identical with those observed by RETZIUS, was pointed out by the present writer some years ago, and was briefly noted by him in the "Journal of Anatomy" 1889, vol. XXIII, p. 573. The passage alluded to reads as follows: „A third element which enters into the construction of a taste-bulb is an intercalary network composed of very delicate filaments, through the meshes of which the sensory cells pass. Whether this intrabulbous network springs from the intra-epithelial or subepithelial plexus I was unable to determine, though I am inclined to believe that it is derived from the latter." This arrangement of the nerves of the bulb (which was detected without the aid of GOLGI's method) was first observed in human embryos, and it has since been verified in various mammals. It is quite possible that the use of the term „network" here is misleading, though, to say the least, this is still an open question. It is highly gratifying to me that my observations should be confirmed and amplified by so accomplished an histologist as Professor RETZIUS.

LENHOSSÉK's views and conclusions touching the structure of the taste-cells are not in accord with those generally accepted by the investigators who have successfully isolated these organs. His statement that the basal pole of the cell is not only not continuous with a nerve-fibril, but terminates in a more or less blunted extremity, is one that many will be unable to accept as final. Whether there be direct continuity, or merely contiguity (as maintained, for example, by FAJERSZTAJN, in the end-disc of the frog), between the sensory elements of the bulb and the underlying nerve structures is still a doubtful question with some, but that the subepithelial nerve-fibrils penetrate the bulbs, as well as run between them, is a fact that has frequently been confirmed by competent observers, even before the existence of an intrabulbous plexus was suspected.

The taste-cells are in their nature excessively delicate and susceptible structures, and an over-refinement of method, even where it is apparently most successful in its results, may partially or entirely fail in its object by disturbing the normal relations of the parts affected. Nevertheless we are much indebted to LENHOSSÉK for his valuable contribution to this very intricate subject, and the full report of his research will be awaited with interest.

Berlin, 14. February 1893.